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ABSTRACT

Two ninth-grade curriculum development projects were carried out over a three-year period (1975-78) in West Virginia at Point Pleasant Junior High School and at Wahama Junior/Senior High School. Known as Project Open, these projects resulted in the development and classroom testing of two new technology-based courses called "Career Exploration in Technology" (CEIT). (The curriculum guides for these two courses are published separately: CE 018 782 is the guide for the Wahama course and CE 018 783 for the Point Pleasant course.) CEIT is designed to be an activity-oriented program that allows each child maximum flexibility in the development of individual potential related to the study of technology. The focus of the Wahama course is communication technology, while the Point Pleasant course deals with transportation. The curriculum guides were developed to reflect local needs and interests in both areas of study. Both projects reported high student enthusiasm and interest during the three years. Recommendations for future project efforts and the two existing courses include (1) an expansion of CEIT to other grades, (2) budget allocations to cover equipment costs, (3) the installation and acquisition of needed equipment and facilities, (4) evaluation of the curriculum's effectiveness in meeting its goals, and (5) transition from university personnel to regular teaching staff. (ELG)

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SUMMARY REPORT ON

PROJECT OPEN IN

MASON COUNTY

1975-78

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PREFACE

This is the final report on two ninth grade curriculum development projects carried out over a three year period by West Virginia University for the Mason County Schools. Known as "Project Open," these projects resulted in the development and classroom testing of two new technology-based courses called "Career Exploration in Technology" (CEIT). One course was developed at Point Pleasant Junior High School and one at Wahama School.

Each course was designed expressly for the students at each school site. In addition, these ninth grade courses were designed to build upon two CEIT courses at the eighth grade level, developed through Project Open in previous years. A curriculum guide for each course resulted from these two projects, and have been made available to school personnel.

This report is divided into two sections, one for each of the two curriculum development projects. Jerry Bacza and Skip Reyns served on Project Open at Wahama School, and their report appears as Section One. The report of the Point Pleasant ninth grade project, developed by Ric Kleine and Randy Hamme, follows as Section Two.

All of us who worked on Project Open at Mason County are indebted to the Mason County Board of Education for supporting this project. The spirit of cooperation among colleagues in Mason County Schools, the West Virginia Department of Education, and West Virginia University made these two projects at once exciting and successful.

David McCrory
June, 1978

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SECTION ONE

FINAL REPORT ON PROJECT OPEN

AT WAHAMA SCHOOL

9TH GRADE

I. Introduction

A. The Project Open Concept

"Project Open" is a curriculum development effort in technology education. The idea for Project Open grew out of the Technology Education Program at West Virginia University as a response to a growing need for new school programs to prepare youth for a technological future.

Project Open in Mason County was initiated during the 73-74 school year with a team of curriculum developers at Wahama Junior High School. Through contractual arrangements with the West Virginia and Mason County school board, a second Project Open team began work at Point Pleasant Junior High School during the 74-75 school year. Due to the success of these two projects, two more curriculum development projects were initiated in the 75-76 school year. A ninth grade project at Wahama High School and a ninth grade project at Point Pleasant Junior High were later added to the school's curriculum.

This report summarizes the curriculum development efforts for the 1975-78 project years at the Wahama Junior High 9th grade project. The materials described here were embodied in a course entitled "Career Exploration in Technology." It was based upon the needs of a specific school, Wahama Junior High, and was developed to be an integral part of the school curriculum.

The model used to implement this curriculum effort, involving two graduate students from West Virginia University, is known as the "Direct Implementor" model. Starting July 1, 1975, the two curriculum developers spent the summer developing a curriculum/instructional plan and materials to be used in implementing a new technology education program. In September, one curriculum developer moved to Mason County and assumed the duties of a full-time teacher in the classroom. Meanwhile, back at West Virginia University, his partner was functioning as a full-time graduate student and as a curriculum resource person for the teacher in the field. During the Christmas recess, the team members traded assignments and responsibilities. (See Figure I below).

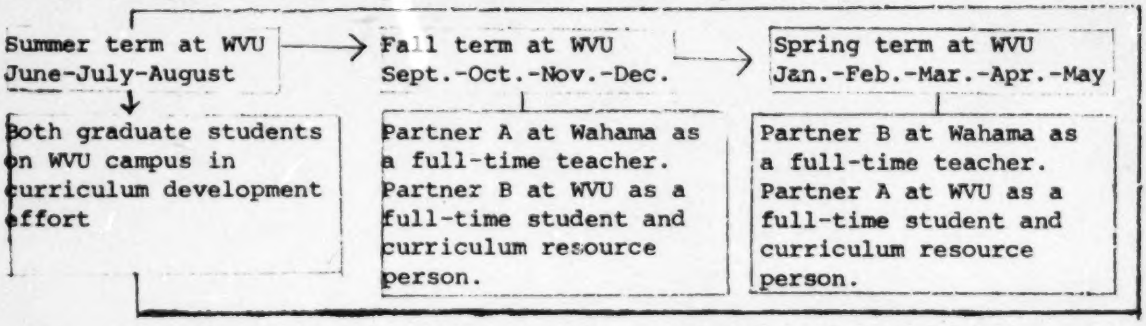
Summer term at WVU
June-July-August
Fall term at WVU
Sept.-Oct.-Nov.-Dec.
Spring term at WVU
Jan.-Feb.-Mar.-Apr.-May
Both graduate students on WVU campus in curriculum development effort
Partner A at Wahama as a full-time teacher. Partner B at WVU as a full-time student and curriculum resource person.
Partner B at Wahama as a full-time teacher. Partner A at WVU as a full-time student and curriculum resource person.

Figure I: Schematic of the "Direct Implementor" Model of Project Open

At the end of three years, the curriculum development phase will be ended and the county will be left with an instructional plan that was developed expressly for, and field tested in, Mason County.

B. Individual Team Members Involved

1975-76 Project Year: Gerald L. Bacza, from Indiana University of Pennsylvania and California State College in California, Pennsylvania teamed up with Richard Dechant from California State College in California, Pennsylvania.

1976-77 Project Year: Gerald L. Bacza remained with the project but received a new partner, David Shores, from Miami University of Ohio.

1977-78 Project Year: Gerald L. Bacza remained with the project and again received a new partner, James Harold Reyns, from West Virginia Institute of Technology.

C. Project Setting

This curriculum development effort took place at Wahama Junior/Senior High School in Mason, West Virginia. The town of Mason is located approximately 15 miles north of Point Pleasant, West Virginia in an agricultural/rural area. However, there has recently been a growth in chemicals and metals industries.

D. Project Site (School)

The Wahama Senior High School is a relatively modern school, adjacent to an older junior high building. Approximately 800 students per year are enrolled in grades 7-12. Our program, "Career Exploration in Technology" was offered to all 9th grade boys and girls for the entire school year. The program took place in a classroom setting in the newer, senior high school facility.

II. Purpose of the Project

A. Definition/Description

The Career Exploration in Technology Course (CEIT) is designed to be a highly charged activity oriented program that allows each child maximum flexibility in the development of individual potential related to the study of technology. Each child is involved with selected cognitive, affective and psychomotor skill development. The skills that the child develcps revolve around selected concepts and systems that have figured significantly in humankind's technological history. The students are provided expereinces with the following technical concepts: tools, processes, materials, communication, transportation, producation and energy. In addition, the following social concepts are considered along with the technical: issues and problems, institutions, and the

environmental/cultural alternatives. These technical and social concepts are integrated and examined within the context of communication technology and its related systems.

B. Course Goal

The primary goal of the 9th grade Career Exploration in Technology course is to provide its students an opportunity to increase their understanding of technology and how it effects their physical and social environment. The major content focus of the course is communication technology, from a systems/network approach.

C. Course Objectives

The specific objectives for this course are derived from the primary goal and are based upon the following factors: an analysis of the structure of technology, the individual needs of the students, the local learning environment and various teacher styles and competencies. The following objectives are developed for the 9th grade CEIT course at Wahama Junior/Senior High School:

1. to develop an understanding of technology and its relationship to humankind, society and cultures;

2. to identify various areas concerned with the overall content of communication technology as it relates to transportation and production;

3. to identify concepts relating to communication technology and to apply these concepts in various systems and networks that utilize communication technology;

4. to describe characteristics, trends and behaviors of technology so that students will better understand the past, present, and future effects of communication technology on individuals and society;

5. to list and describe selected career and occupational roles as they relate to the study of communication technology;

6. to provide students with a variety of experiences aimed at using an organized, systematic method of inquiry to solve problems;

7. to develop a good working attitude of safety as it relates to the school and the outside environment, and

8. to provide students with an opportunity to explore various communication technology concepts such as: tools, processes, materials, energy and the environment as they relate to the human condition.

D. Curriculum Development and Planning

A major purpose of the Project Open effort is to coordinate the county curriculum development efforts in the technologies, so that as the project is phased out, the county will be left with an overall curriculum/instructional plan that has been field tested and evaluated. To accomplish this, the curriculum developers were constantly re-examining the content being taught and the various instructional strategies being used. Over the course of three years, the developers have refined the focus of the course to center in on the study of selected universal concepts within the area of communication technology and its related systems. These refinements are the result of: in-depth study into the discipline of technology within the area of communication, a study of the communication systems in Mason County, and the perceived interests and needs of the students attending Wahama Junior/Senior High School.

Figure II is a graphic representation of the communication technology content derived from the discipline of technology. The three major content areas, Visual, Acoustic and Tele, are derived from the pool of information that occurs between the interface of sensory based systems and energy related systems. These three content areas are explored through six main concepts: creating, transmitting, processing, receiving, preserving and retrieving.

A brief summary of major events over the past three years will indicate the changing and evolutionary nature of this Project Open. The content approach, class operation, facility development, financial analysis and problems/issues will be outlined on a year by year basis to point out the change that has taken place.

Summary of Major Events for the School Year 1975-76

1. Content Approach: This was the initial year in the CEIT curriculum development project at the 9th grade in Wahama Junior/Senior High School. A pilot curriculum plan was developed and implemented in the school. In the beginning, many of the activities and content were related to industrial arts because of the backgrounds of both teacher/scholars involved.

The central focus of the course during this first year was communication technology and how it related to technology and our environment. The major units of NON-VERBAL, AUDIO and AUDIO-VISUAL were presented. The influence of humans and their environment was also discussed as it related to these three units. The last unit on AUDIO-VISUAL had to be dropped when time ran out in June.

This first year was foundational in nature and the two developers recorded the day by day progress for subsequent development. A daily-

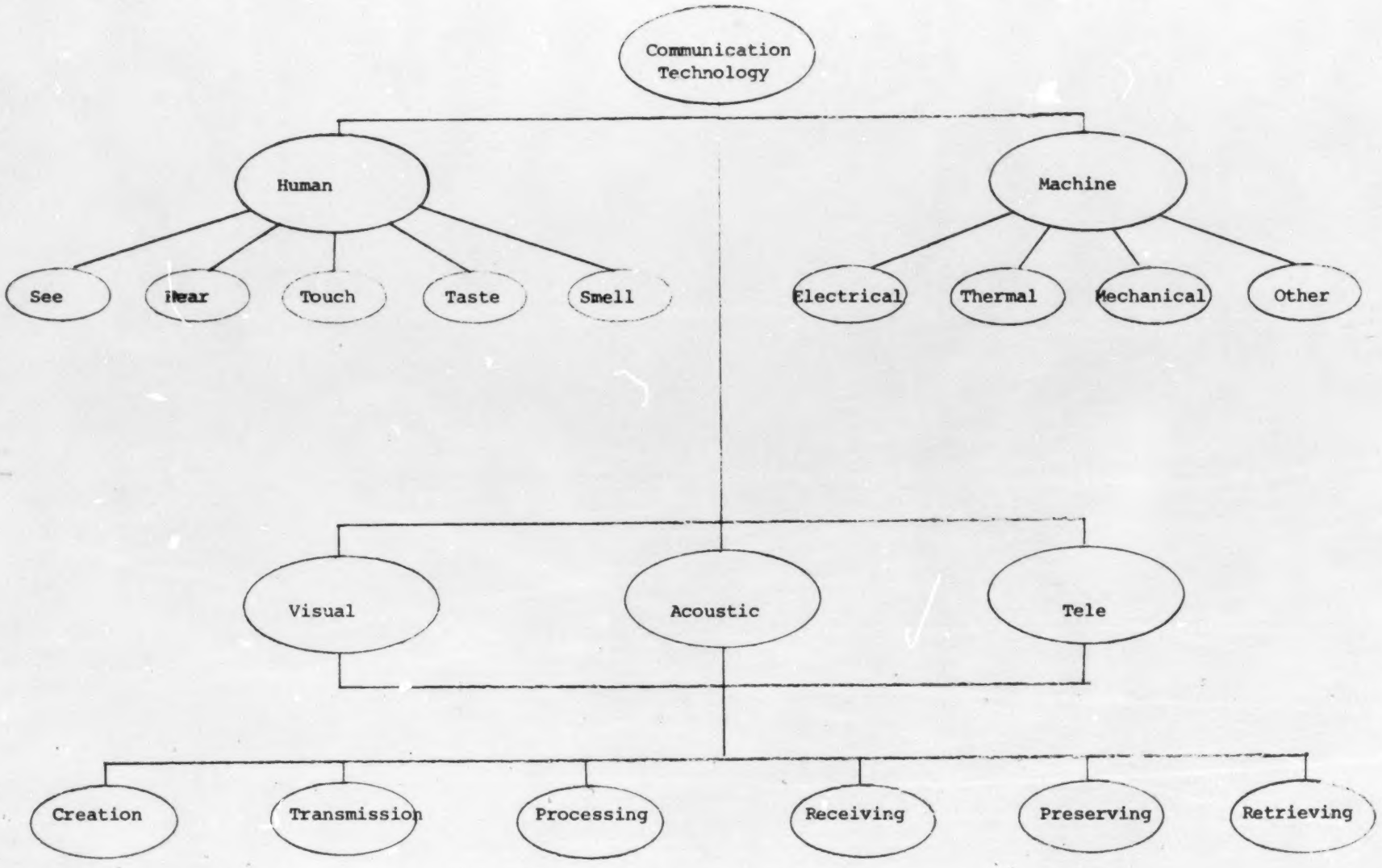

Figure II: Communication Technology Content derived from the Discipline of Technology

weekly log of activities and events were regularly filed with the University faculty to keep abreast of progress and evaluations of daily lesson plans were recorded for future analysis. In this way, the second year's approach chould be built upon the good points of Year I.

2. Class Operation: During this first year, the 9th grade CEIT program enrolled a total of 102 boys and girls, including 45 girls and 57 boys in 6 classes that were taught throughout the day. Class sizes varied from a minimum of 14 to a maximum of 20 students. This maximum of 20 per class was mandated so that safety regulations could be enforced and the classroom managed properly. It was also this year that the 9th grade CEIT instructors assumed the responsbility of 9th grade class advisors and conducted a 9th grade homeroom period.

3. Facility Development: When school began in September of 1975, the CEIT classes started with little more than a teacher's desk, 20 chair/desks and 2 tables. The first major facility accomplishment was to repaint the classroom and to paint a mural on the back wall entitled "Wahama White Falcons." Two display areas, in the shape of a triangle and circle were also painted on the wall as a backdrop for posters and other educational materials. A white square was painted on the other side wall to serve as a projection screen for 16mm films, filmstrips, and overhead projectuals.

By the time the painting was complete, some storage equipment had been purchased at the government surplus warehouse in Charleston. From this equipment, a cabinet was fashioned to store student notebooks and a technology book shelf was started. There still was not adequate storage facilities, however, for the small amount of tools that had been ordered.

4. Financial Analysis: On September 1, 1975, the CEIT program began with an operating budget of $300.00. This proved to be an insufficient amount of money to initiate an activity-oriented course which had nothing more than desks and tables to work with. On October 29th, an additional $250.00 was granted to spend on equipment and supplies. This gave the project a total of $550.00 for the fiscal year to buy storage equipment, classroom supplies and equipment and instructional materials. This amount averages out to $5.39 per student for a full school year. Money for supplies and materials proved to be a major problem throughout the school year.

5. Problems/Issues: As with any new course, many problems and issues arose during the first year. The main concern was for adequate supplies and equipment. Money that could have been used for instructional materials such as tools, supplies, small equipment, books, journals and magazines had to be diverted into the acquisition of furniture for the classroom such as book shelves, storage cabinets, and file cabinets. Because of the great need for furniture and a storage area, classroom instruction was hampered and many man hours were spent looking

for lost-cost items, refinishing the old items and in placing them in the classroom.

The course content and relating activities had to be changed because the supplies that had been ordered were late in arriving. A good point to consider, with the late arrival of supplies, was that it gave the instructor a chance to assess the needs of the students and adjust the course content appropriately.

Also, during this initial year, the two curriculum developers tried to integrate themselves and the course into the school system of Wahama. This task was somewhat successful and at times very frustrating.

With a vast amount of small problems and issues arising during the first year, it was considered to be a successful one by the county and university personnel involved.

Summary of Major Events for the School Year 1976-77

1. Content Approach: The second year of program development was significant for two reasons: (1) the curriculum content and structure was redesigned to better meet the needs of the students of Wahama Junior/Senior High School, and (2) a new Direct Implementor partner was assigned to the Project Open team. During this year, the focus of the course did not change considerably but built on the framework established from Year I. The general theme of communication technology remained but shifted from an emphasis of the man/machine relationship of communication to a systems approach. A communication model was developed in the beginning of the school year and used to analyze other types of communication systems.

Also during Year II, a program philosophy was developed for the study of technology and communication technology. Goals and specific objectives were developed that were conducive to this philosophy. Units of instruction were organized around the program's philosophy and goals to include: an introduction to the study of technology; individual communication; group communication; mass media, and broadcast communication. With the additional materials and supplies, more activities were used in the classroom to relate to course content.

A small special education class was also scheduled during this second project year to provide individualized instruction to 8 students with special needs. Also, the curriculum developers were assigned to the library and librarian for one period a day to establish a media center for the school.

2. Class Operation: During this second year the 9th grade CEIT enrolled a total of 88 boys and girls, including 37 girls and 51 boys

attending 5 classes. Class sizes varied from a minimum of 8 to a maximum of 20 students. Again, the CEIT instructors assumed the responsibility of 9th grade homeroom periods. An additional duty for the two instructors was an early morning responsibility for supervising students arriving at school on the buses and in automobiles.

3. Facility Development: This second year included several developments for the 9th grade CEIT program. A photography laboratory was built and utilized in the junior high school building. An enlarger was donated to the program by the 9th grade CEIT program at Point Pleasant Junior High School. A media center was initiated and utilized with great success in the senior high library. The classroom was repainted a color more appropriate for a learning environment. There was an acquisition of storage facilities and construction of a bulletin board. A reading area was also constructed in the classroom and more books acquired for the technology bookshelf. In general, the 9th grade program branched out into the school and became accepted as an integral part of the school curriculum.

4. Financial Analysis: As in the previous year, the biggest overall concern of the project was related to the budget. The 9th grade program received a total of $600.00 for the 1976-77 school year. This would have been sufficient to buy supplies for instructional use during activities but a large portion had to be diverted for the acquisition of instructional equipment and storage facilities. With the total of 88 students, this averaged out to approximately $6.81 per student for the entire year.

5. Problems/Issues: Again, the major concern during this second year was the lack of money. The problem was not as great as Year I, but the course did not operate as smoothly as it should have because of the lack of money. Because of increased cooperation with school administration and faculty, the course was implemented much better than Year I. A problem with the weather was encountered during the second semester. Three weeks of classes were cancelled due to the snow and fuel shortage. This required an adjustment of the time schedule for presentation of the units of study.

Also, a formal evaluation of the course and instructors was conducted at the end of the school year. The results proved to be very favorable. (Refer to the Annual Report on Project Open, Wahama High School, 9th Grade CEIT, 1976-77 school year).

Overall, the second year proved to be very rewarding. Much was accomplished with the course content, class operation, school involvement and facility design. The CEIT course became very well established in the Mason County public school of Wahama.

Summary of Major Events for the School Year 1977-78

1. Content Approach: This third and final year of Project Open

was exceptionally important. In this year, the program needed to be re-evaluated and content for the course redirected to complete the educational and curriculum goals for the ninth grade Communication Technology course. Several meetings including the project team of Bacza/Reyns, Dr. McCrory and Dr. J. B. DuVall proved very helpful in reviewing the content for the course in this last year. Considering all the data collected in the first two years of the project and the socio/cultural nature of Mason County, a curriculum developed from Foundational Technical Developments in the Communications Field was adopted. Each Foundational Technical Development (FTD) became a unit within the course. FTD's were positioned into one of three major content organizers: (1) Visual, (2) Acoustical, and (3) Tele-Communications. In this 77/78 project year, team member Bacza presented the Introduction to the Study of Technology and the Visual Communications during the first semester. Team member Reyns presented the Acoustical and Tele-Communications areas during the second semester.

Each of the basic units if instruction (1) Introduction to the Study of Technology, (2) Visual Communication Technology, (3) Acoustical Communication, and (4) Tele-Communication were analyzed from a systems approach and time perspective. The systems approach to the unit was concerned with the creation, transmission, process, reception, storage and retrieval of information. The time perspective allowed the students to research past developments, current trends on state of the art and future implications the system might have.

2. Class Operation: CEIT classes in Year II accommodated 110 students, of which 67 were boys and 43 were girls. Class sizes varied from a minimum of 15 to a maximum of 20 students. CEIT instructor duties included early morning homeroom for seniors on the Vocational bus, hall monitoring after each class and lunch monitoring duties several times during the year for one week sessions. Occasionally, instructors were asked by the principal to fill in for another teacher's homeroom or in taking a class during planning periods.

3. Facility Development: This third year saw several additional facility development changes. First of all, the Photography Laboratory constructed during Year II was reorganized and some new equipment added to enhance instruction. New sources were added to the media center which aided students in doing reports and in writing their major communication research paper. During the second half of this third project year, the CEIT classroom noted more changes. First, all furniture was relocated to allow easy access to cabinets and shelves. This movement also permitted a better flow of students to certain areas. Second, some lumber was purchased near the end of this school year and the instructor erected some large heavy duty cabinets for storage of large items. The reading area in the classroom was further developed through the purchase of additional reference material.

4. Financial Analysis: The CEIT program began the school year

with an operating budget of $250.00. During the first part of the year, $150.00 was used to purchase materials and the remaining $100.00 was utilized for the second term. With the total of 110 students, financial assistance for each student averaged out to exactly $2.27 for the year. The sum of $2.27 per student was $4.54 less than the previous year and $3.12 less per student than the first part of the project year Near the end of school a $500.00 allotment was given but none of the materials ordered could be utilized for classroom instruction do to late shipping. Supplies were ordered, however, for the 1978-79 school year.

5. Problems/Issues: The major concern again for Year III was an insufficient amount of money. A total amount of $250.00 was allotted for 110 students. This was not enough to run a good, activity-oriented course.

The facility still needs to be improved in the following ways:

1. Running water needs to be connected to the sink so students don't need to leave the classroom for cleanup.

2. Insufficient heat in cold winter hinders classroom instruction and participation. Amore efficient heater should be installed.

3. Periodic flooding of the room occurs due to drainage problems. Any hard rain or srow leaves the room with several inches of water.

4, More chalkboard space is needed for effective instruction.

Generally, the course integrated itself into the school system and became a vital part of the total school curriculum. This occurred from an increased faculty awareness and interest in the program.

The curriculum was implemented very smoothly because of organizational efforts that occurred during the summer months working with the West Virginia University Technology Education Program faculty.

Overall, the year progressed very smoothly and with much success. The 77-78 school year was rated the very best of all three project years.

IV. Conclusions

A. The interest, enthusiasm and support has been excellent through the three year project on part of the county administration and staff along with the West Virginia University personnel.

B. The interest and enthusiasm by the students has been increasing continually over the three year period especially during the 1977-78 school vear.

C. As a result of the three year developmental effort, a curriculum/

instructional guide was devised in order to facilitate the transition to a permanent county teacher. That printed guide will be made available to Mason County School personnel.

D. A curriculum reflecting the study of technology was developed and based on local needs and interests. Related instructional materials were also developed and tested in the classroom.

V. Recommendations

A. The number of students allowed in the CEIT class should not exceed 20 students. This takes into account safety factors related to the activity-orientation facility size and operating budget.

B. University and county personnel should work with the transition teacher very closely to continue the program development in the future.

C. Fiscal responsibility for the CEIT program should be placed under the direction of the school principal. This would allow the course to become more integrated with the school and reduce process time for the ordering of equipment and supplies.

D. An open account should be maintained by the building principal for the CEIT program to buy unexpected supplies and materials on short notice.

E. The Technology Reading Center within the classroom should be expanded to meet the every changing needs of the 9th grade CEIT students.

F. A sink has been partially installed in the classroom. It is recommended that water beconnected to alleviate the necessity for students to leave the classroom for cleanup.

G. It is necessary that a fire extinguisher be installed in the CEIT classroom. Flammable chemicals and materials are often present and prove to be a hazard without the protection of a fire extinguisher.

H. The curriculum plan should be expanded to the 7th and 10th grades. This would better meet the needs of Wahama students in preparing for their future.

SECTION TWO

FINAL REPORT ON PROJECT OPEN

AT POINT PLEASANT JUNIOR HIGH SCHOOL

9TH GRADE

I. Introduction

A. Project Open Concept

"Project Open" is the term used to define the curriculum development effort in the area of technology education. The concept was developed by the Technology Education Program at West Virginia University for the Mason County Board of Education. The function of the project was to provide technology based curricula (through a three-year development process) in schools which previously had no industrial arts or technology education curricula.

Two doctoral level graduate students were employed to design, develop, implement, evaluate and revise a technology based curriculum at Point Pleasant Junior High during a three year period. As part of their ninth grade responsibilities, each of the two curriculum developers was required to take up residence at the project site to implement the curriculum and to perform the duties of a full-time teacher one semester of each school year. At the end of the third year, the curriculum was ready for transition to a full-time teacher for the future continuation of the developed curriculum.

This report summarizes the ninth grade curriculum development efforts for the 1975-78 project years at Point Pleasant Junior High School. The course developed during that period was titled "Career Exploration in Technology" (C.E.I.T.) and the curriculum focus was on the content area of transportation.

B. Team Members Involved

The team members of the ninth grade C.E.I.T. project at Point Pleasant Junior High School were Randall L. Hamme and Richard E. Kleine. Mr. Hamme is a graduate of Temple University, Philadelphia, Pennsylvania, and had previously taught in Harrisburg, Pennsylvania. Mr. Kleine is a graduate of Indiana State University, Terre Haute, Indiana, and had previously taught in Indianapolis, Indiana.

C. Project Setting

Mason County is located along the Ohio River on the western border of West Virginia. The community of Point Pleasant is located within Mason County at the confluence of the Kanawha and Ohio Rivers. The community is primarily agriculturally based, with an increasing trend toward metallurgical and chemical industrialization.

D. Project Site

Point Pleasant Junior High School is comprised of grades 7-9 with a total enrollment of approximately 1200 students. There

are two Career Exploration in Technology courses offered in the school curriculum. An eighth grade course, which was transitioned to a full-time teacher in 1977, is one semester in length and is required of a. eighth grade students. The ninth grade course is a full year (two semesters) in length and is offered as an elective.

II. Purpose of the Project

A. Description

The Career Exploration in Technology (CEIT) course is an activity centered program to provide students with opportunities to increase their understanding of the technological society in which they live. Each student is involved, to varying degrees, with selected cognitive, affective, and psychomotor skill development activities.

The ninth grade course was designed to give the student a broad perspective of the area of transportation and the career opportunities which exist in that area. The main thrust of the course centered around transportation vehicles, their systems, their principles of operation and the technical and social problems which resulted from their use.

B. Course Goal

The overall goal of the C.E.I.T. course is to provide the students with an opportunity to increase their understanding of the technological society in which we live so that they will better be able to exercise choice in the control and redirection of technology for humane purposes.

C. Course Objectives

The following course objectives were written to provide a basis for the curriculum development process. These general objectives are designed to establish direction for developing student activities dealing with group effort and cooperation, problem solving, safety and transportation. In support of these objectives, specific unit objectives were developed to incorporate the content into the overall curriculum design:

1. to provide students with technological awareness through an examination of human creation and use of technology in an attempt to control the environment;

2. to provide students with a variety of experiences aimed at using an organized, systematic method of inquiry to solve problems;

3. to provide students with a variety of experiences that will reinforce the development of skills in reading, writing, and computational ability;

4. to develop in each student a positive attitude toward safety;

5. to provide students with a variety of group activity experiences in which each student will learn the importance of cooperation and group effort;

6. to develop in each student an awareness of his/her own career potential as it relates to the world of work; and

7. to develop in each student an awareness of transportation and its place in our society.

D. Curriculum Development Process

The three year curriculum development process consisted of continuous implementation, evaluation and revision of course content, activities and presentation methods. The summer months were utilized for evaluation and revision while the school year was for the implementation. Development work, however, was occasionally conducted during the implementation phase when the need existed.

The content was determined from a study of technology and was organized into three sub-areas of transportation. See Figure I. These sub-areas, environments in which transportation takes place, provided the necessary foundation to identify the technical content of transportation and to investigate the effects of its application. The course was designed to cover the need and function, the historical development, the contemporary use and resulting problems, and future trends of transportation.

Although these topics have remained virtually the same during the three years of development, the actual implementation and time devoted to each in the classroom has continually changed. The following section is a summary of the three years of curriculum development. It is presented to provide a year-by-year evolutionary review of the major changes and development of the C.E.I.T. ninth grade course.

III. Evolutionary Development

A. Summary of Events for the School Year 1975-76

1. Content and Instruction: The beginning year of the project was unique in that the content was based in two different areas of technology. The school year was separated into two distinct parts corresponding to the natural division of the semesters. During the first semester the content focused on the technical area of communication. The theme of advertising was used in presenting this subject matter to the students. Major units were developed on perception, analysis and application as they related to advertising systems.

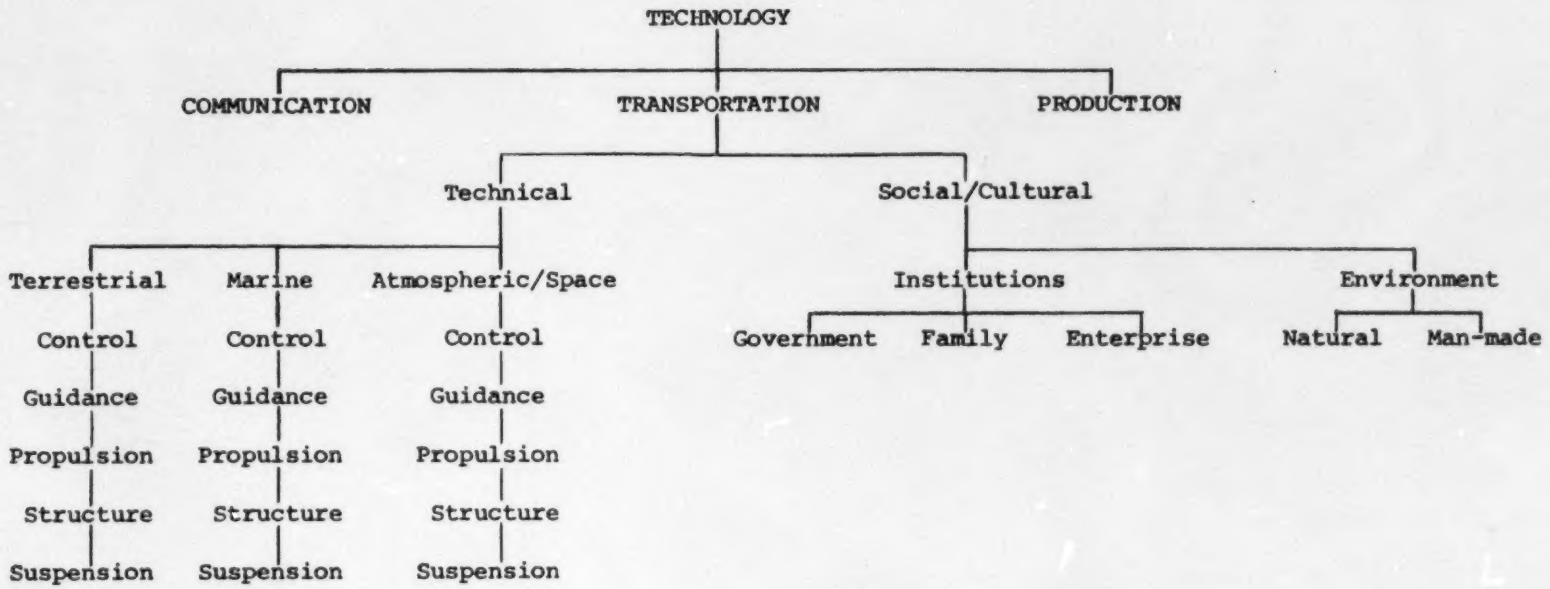

Figure I: Content Structure for 9th Grade C.E.I.T. (Transportation)

The second semester's content focused on the technical area of transportation. The transportation content was developed to allow the exploration of all areas of the transportation industry. The exploration of contemporary transportation was oreceded by a unit on the history of transportation. All three environments of transportation (land, water, air) were included in the course. A unit on future trends was included to provide an outlook on the possible future of transportation.

A variety of resources were used in the two content areas described above. Much material was obtained from various industries and organizations which provided free and inexpensive reference materials. The methods of instruction were of two types. The use of traditional classroom teaching activities and specially designed individual and group activities to reinforce the learning which took place by the traditional methods. These specially designed activities were hands-on types of action activities in which the students were involved with constructing collages, producing and video-taping presentations, taking and developing pictures, designing and printing greeting cards, designing and building primitive vehicles, constructing simple steam turbines, experimenting with airplane control and constructing model rockets.

2. Facility Development: During the first year a number of major changes were made to the traditional classroom which was assigned to the project. The room was completely repainted and large graphics for the room. All painting and design work was done by the students. The armchairs which were in the room originally were replaced with cafeteria type folding tables and chairs. A storage area in a nearby room was available. This room was set up for organizing materials by the 8th grade project team the previous year.

3. Financial Status: The initial budget for supplies for the course was $600.00. This money was allocated for both tools, equipment, and materials. The eighth grade course had received a significantly larger amount the year before and it was determined that the two courses (8th and 9th) could share the equipment purchased with the original money.

Ninety students were enrolled in the course during the first year. This provided $6.66 per student for tools and materials for the entire year. However, the budget was cut by approximately $200.00 at the end of the first semester, bringing the amount per student down to $4.44.

4. Evaluation Feedback: The evaluation of the project was established through student achievement, administrative feedback and project related personnel. Student achievement and attitudes were good with much enthusiasm displayed by the majority of students enrolled in the course. Administrative written and verbal evaluation was positive and supportive. The university project personnel expressed

positive evaluation in letters of correspondence throughout the school year.

5. Problems and Issues: Four major problems were cited as needing attention at the end of the first year of the project. First, the classroom was shared with the math department first period each day. This time was often needed for setting up demonstrations, experiments or tools and materials for project teacher activities. Second, the class sizes were poorly distributed. They varied from a minimum of 9 to a maximum of 24. A third problem centered around the handling of budget money for supplies. After January 1, all money which had not been spent was no longer available. Lastly, a fire extinguisher and first aid kit were needed for the classroom. Attempts to obtain these items during the first year were unsuccessful.

B. Summary of Events for the School Year 1976-77

1. Content and Instruction: A major change in course content was made at the beginning of the second year. The combination of communication and transportation as the content for the course was changed to transportation only. This was necessary due to the resignation of project staff member, David W. Axon at the end of the first year. Randall L. Hamme joined the project in July, 1976, to take over Axon's position as a training associate.

As a result of the change in course content, the transportation section was greatly expanded. The course was divided into three sections: land and tranportation; water transportation, and air transportation. These areas included units on their history and its cargo and method of propulsion. An additional unit on problems and future trends was added as a summary of contemporary use. A final unit on the systems approach was included at the end of the school year to show the relationship of all three content areas working together.

Classroom activities used during the first year were evaluated and revised to better meet the needs of the students. Additional activities were developed for the expanded course contact. During the second year the students were involved with a variety of individual and group activities. These activities included: (1) individual and group reports on various types; (2) problem solving situations; (3) primitive vehicle design and construction; (4) simple steam engine construction and testing; (5) mousetrap powered vehicle design problem; (6) marine vehicle design problem, (7) wind tunnel aerodynamics experiments; (8) posterboard airplane mass production; (9) model rocket construction, and (10) alternative energy experiments. All activities were developed to include as much reading and mathematics as was feasible. The majority of the students enrolled in the course were considered to be weak in these two subject areas, so emphasis was placed on these skills to enhance basic learning.

2. Facility Development: Minor changes were made to the room during the second year. Storage shelves were added for material and product storage during activities. These had been discarded by the athletic department and required only minor alterations and painting before being placed in the CEIT classroom. A reference/ resource area was also set up for books and magazines. An incomplete set of used encyclopedias was acquired for the area.

Since the classroom had been originally designed as a traditional classroom, no water or drainage was available. During the second year a portable sink and drain was constructed for use in the classroom. Water was brought in and dispensed from gallon milk containers.

3. Financial Status: The supplies budget in this second project year was set as $500.00. This amount was $100.00 less than the budget for the previous year. Difficulty was experienced with orders however, and as a result, approximately $205.00 was not available for project use. This brought the dollar per student figure down from $5.68 to $3.35 for the entire school year.

4. Evaluation: The curriculum review procedures used for the first year of the project were again used for the second. A more extensive effort was made to determine the students evaluation of the course by the administration of course evaluation forms to all students enrolled in the course. The results showed that the vast majority of the students had a positive attitude toward the course. Evaluation was sought from administrators and university project advisors and the feedback received was positive in all instances.

5. Problems and Issues: Two problem areas were cited as needing attention at the end of the second year. These dealt with the course budget and safety. The main problem was with budget. As was the case during the first year, a substantial amount of money was lost due to a budget freeze after January 1. Approximately $205.00 of the budget was not spent because of the budget action. A second problem related to this was the difficulty in working with the vocational school in keeping track of the status of orders which were placed during the school year. In addition there were problems in getting an accurate report of the balance of the remaining budget. It was the opinion of both training associates that a "petty cash" fund should be made available for unexpected expenditures which emerge during the school year.

The second problem area, that dealing with safety, consisted to two sub-areas: fire protection, and first aid. The need for a fire extingusiher and fire blanket for the classroom was imperative due to the type of materials and equipment used in the course activities. A first aid kit was also requested for treating minor injuries. Requests for both types of items went unanswered by the school system.

C. Summary of Events for the School Year 1977-78

1. Content and Instruction: The final year of the curriculum development project was in general terms a period of refinement and final testing. The major units established during the second year were reorganized and revised to provide a systematic course of study in the area of transportation.

The major sections of the course remained as the three environments of transportation. The units on power and energy were combined to include material common to all three sections and thus eliminate unnecessary repetition. Each section consisted of a history and development unit, contemporary transportation unit and a future unit, which was related to contemporary problems. The largest unit was the contemporary transportation unit. The final transportation and the systems approach to transportation. This is shown in a general topic paradigm in Figure II.

Cooperation with other teachers in the school was much improved during the third year. This was very much the case with the science department as a great deal of duplicate and complimentary material existed between the two classes. Emphasis was again placed on reading and computational skills in designing activity materials. This was started the second year but was more apparent in the third year activities.

Learning activities for the final curriculum design were for the most part action-type, hands-on activities. These were developed around a "less cost more options" philosophy and utilized mostly free and inexpensive materials. Alternative activities were also identified to take into consideration the difference in student abilities. Major activities, aside from reading and report types of activities, included primitive vehicle mechanical advantage experiment, early wheeled vehicle group design and construction, internal combustion engine experiments, mousetrap vehicle construction design problem, 10 speed bicycle gear ratio experiments, future transportation vehicle systems experiments, marine buoyancy experiment, wind tunnel airplane control design models, model rocket construction and transportation system design.

2. Facility Development: Little change was made in the classroom area during the final year. Two laboratory type tables were acquired from the science department. These were used as study tables for the resource area, and during activities they doubled as work tables for clamping vises for sawing and drilling operations.

A set of Science and Technology Encyclopedias was donated by the Technology Education Program for the resource area. These were shared with all Mason County projects.

3. Financial Status: The amount budgeted for the final year

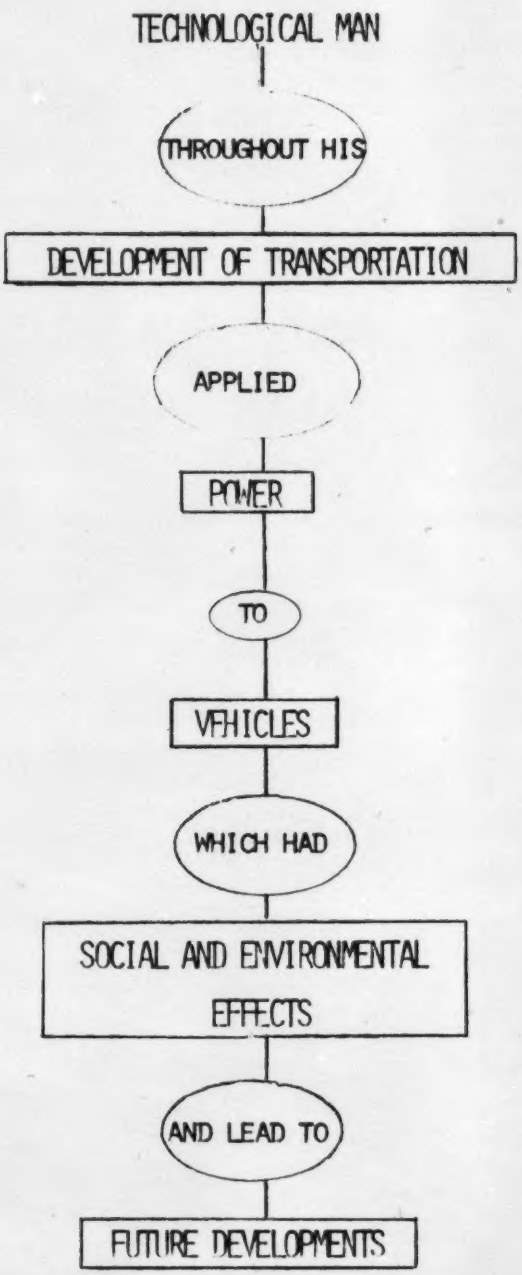

Figure II

A Schema of Course Design for 9th Grade CEIT
(Transportation)

was $250.00 for supplies and equipment. This was by far the lowest figure for the three years of the project. The expenditure per student for materials was $2.71. This made no allowance for equipment repair or replacement.

4. Evaluation: The evaluation design of the final year consisted of three phases. The first phase was to review the findings of the research study conducted by Dr. Wayne Andrews on the attitudes of Point Pleasant Junior High School faculty and administration toward the curriculum project in general. These findings showed a positive attitude toward the course and its intended goal.

The second phase was a repeat of the second year student evaluation of the course. Consistent with the findings of the previous year, the students' attitudes were positive toward the course. It was observed that the students were enthusiastic about the course and the various activities in which they were involved throughout the entire year.

Phase three consisted of requests by the project training associates of the administrators and university project advisors for written letters of evaluation. This evaluation was to be of the course as it developed over the three year period. No formal effort was made to attain feedback from the community, however, any questions or comments concerning the course were always welcome.

5. Problems and Issues: The budget remained a problem throughout the three year period. The low amount of the third year budget hindered the effectiveness of the project by forcing the cancellation of student activities which required certain types of purchased materials. Also, there were not adequate funds for replacing and repairing equipment. The problem of working through the vocational school for requisitioning continue through the third year. This problem stems from one of convenience and authority. Difficulty was at times experienced in obtaining a set budget figure from the assistant director of the county vocational school, who served as project liaison.

IV. Conclusions

A. Curriculum and instructional materials reflecting the study of technology and based on local needs were designed, developed and tested in the classroom over a three year period.

B. As a result of the three year effort, a curriculum guide was devised in order to facilitate transition to a permanent county teacher and continued program development.

C. The facility assigned to the project personnel was altered to meet the needs of the training associates teaching the course thus establishing that the course can be taught utilizing a basic classroom

facility instead of a less flexible and more expensive laboratory in shop facility.

D. Student enthusiasm and interest in the course was high throughout the three year period. Despite the fact that the course was offered as an elective, enrollment continued to remain high all three years.

E. Interest, enthusiasm and support by the staff, administration and university personnel has been excellent through the three years.

V. Recommendations

A. The budgeted monies for supplies and equipment for the Career Exploration in Technology courses should be put under the direction of the building principal.

B. A budget of not less than $500.00 for equipment and supplies should be set for the C.E.I.T. courses. This amount would allow for the necessary replacement of equipment on a yearly basis and still provide sufficient funds for student activities.

C. An open account of not less than $100.00 should be maintained by the building principal as a means of responding to unexpected needs such as equipment repair and additional materials.

D. The maximum number of students enrolled in any C.E.I.T. class should not exceed 20 students. This number is the absolute maximum for the size of the facility and for a safe working environment with adequate supervision.

E. An outside agency should be brought into evaluate the overall effectiveness of the curriculum in meeting its stated goals and objectives.

F. Continued effort should be made to develop a 10th grade course which would relate to the 8th and 9th grade courses presently established.

G. University support of the project transition person should be maintained for at least one year after the transition takes place.

APPENDIX

WEST VIRGINIA BOARD OF REGENTS

on behalf of

WEST VIRGINIA UNIVERSITY
MORGANTOWN, WEST VIRGINIA 26506

PROJECT OPEN AGREEMENT

(CONTINUATION)

with

MASON COUNTY SCHOOLS
POINT PLEASANT, WEST VIRGINIA

August, 1977

The following agreement is between the Mason County Board of Education and the West Virginia Board of Regents, hereinafter referred to as "Board," acting for West Virginia University, hereinafter referred to as "University." The University, through its Technology Education Program, agrees to provide the following curriculum development services for Mason County, West Virginia for the period of July 1, 1977 to June 30, 1978.

I. Purpose of the Agreement:

This Project Open Agreement is designed to provide the County with:

1. instructional programs in technology education developed expressly for Mason County,

2. teams of competent teacher/scholars to field test the programs, and

3. professional development for Mason County teachers involved with the new programs.

Project Open is planned on a cooperative basis with the County in order to correlate with the County's educational plan. The project is referred to as "Project Open." Project Open is designed to provide county school systems with planned educational programs and personnel development services. Ordinarily, the design and development period for each new instructional program is based on a three-year time frame.

II. Structure of the Project:

When the project was initiated in 1973, for each teaching position identified, two qualified teacher/scholars were selected by the County and the University. After agreement was reached on the qualifications of the personnel, they were employed as Training Associates by the University. This agreement constitutes a continuation of those teacher/scholar positions.

From July 1 through August 31, each team of two Training Associates designs an instructional program for implementation in the schools selected by the County. The development work is supervised by the University's Technology Education Program, with cooperation from the County.

September 1 through January 31 - Training Associate "A" on each team assumes the duties of full-time teacher in the County. Training Associate "B" serves as a resource person for "A", and resides at the University. During this time, Training Associate "B" is on call to provide instructional materials, devices, or other assistance required for successful implementation of the project.

January 31 through June 30, Training Associate "A" and "B" exchange roles. The two Training Associates serve as a team and both share responsibility for success of the project.

July 1 through August 31, both Training Associates return to the University to compile an annual progress report to the County, and to assess and revise the instructional plan.

III. Responsibilities of the Training Associates:

Each Training Associate will continue to:

1. plan a program of action leading to the design, development, implementation, and publication of an appropriate curriculum in technology education for the project school(s),

2. implement an instructional program based on the curriculum design,

3. provide ancillary services as required or requested for the success of the project,

4. develop and conduct an assessment of the project as the program proceeds, and

5. compile and distribute to the County School Superintendent the results of the project, including reports of the instructional design, implementation, and evaluation.

IV. Responsibilities of the University:

The University will continue to:

1. supervise each curriculum development project, in cooperation with the County personnel, including provisions for management functions, professional services, and design functions as required by the program;

2. recruit, screen, recommend, and employ, in cooperation with County personnel, project personnel qualified to insure a successful program;

3. provide support services for the project, through the Technology Education Program, including personnel training, curriculum design, instruction, and evaluation; and

4. provide tuition, fees, and other benefits available for salaried graduate students as Training Associates participating in each project.

V. Responsibilities of Mason County:

The County will continue to:

1. provide tools, equipment, materials, and supplies as required for each program, but not less than $4,000 total expenditures in these categories for all four instructional programs;

2. assign a member of the County Superintendent's office to the project as a liaison with the Technology Education Program at the University; and

3. secure the cooperation of all County personnel directly related to the project, including the principal of the school where each project is implemented.

VI. Time Schedule:

This continuation of Project Open is designed for a twelve (12) month time period beginning July 1, 1977 and terminating June 30, 1978. This schedule permits time for both preparation and evaluation of the project.

VII. Termination of the Agreement:

West Virginia University and Mason County may terminate the agreement by mutual consent:

1. prior to contract implementation if project personnel are not secured by July 1, or

2. prior to completion of a full contract if both parties agree on a negotiated settlement.

VIII. Payment Schedule:

The Board of Education, Mason County, will reimburse the University for costs of the program according to the following payment schedule:

1st payment.....	July 1, 1977	25% of total contract
2nd payment.....	October 1, 1977	25% of total contract
3rd payment.....	January 1, 1978	25% of total contract
4th payment.....	April 1, 1978	25% of total contract